



Project in Development and the Environment

Environmental Strategy for USAID/Morocco

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The objective of the Project in Development and the Environment (PRIDE) is to help the U.S. Agency for International Development (AID) design and implement programs that foster the agency's environmental and natural resources strategy for sustainable economic growth in the Near East and Eastern Europe.

PRIDE provides AID and participating countries with advisory assistance, training, and information services in four program areas: (1) strategic planning, (2) environmental policy analysis, (3) private sector initiatives, and (4) environmental information, education, communication, and institutional strengthening.

The project is being implemented by a consortium selected through open competition in 1991. Chemonics International is the prime contractor; subcontractors include RCG/Hagler, Bailly, Inc.; Science Applications International Corporation; Capital Systems Group, Inc.; Environomics, Inc.; Industrial Economics, Inc.; Lincoln University; and Resource Management International, Inc. In addition, AID has entered into a cooperative agreement with the World Environment Center to support implementation of PRIDE.

The opinions expressed in this paper are those of the author(s) and do not necessarily reflect the positions of the sponsoring agency or contractors.

Environmental Strategy for USAID/Morocco

by

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LIST OF ACRONYMS

ANE	USAID Bureau for Asia/Near East
ANHI	National Upgrading Agency
BEI	European Bank for Investment
CAC	Command and Control
CDER	Centre de Developpement des Energies Renouvelables
CEEA	Cellule Etudes d'Evaluation et Audits
CEIE	Cellule Etudes d'Impact sur l'Environnement
CEM	Centre de l'Entreprise du Maroc
CFD	Caisse Française de Development
CGA	Cellule Gestion et Administration
CO	Carbon Monoxide
COD	Chemical Oxygen Demand
CRA	Comparative Risk Assessment
DM	Deutsche Marks
DSTS	Development Studies and Technical Support
DYNA-PME	New Enterprise Development Project
EAP	Environmental Action Plan
ecus	European Currency Unit
EIA	Environmental Impact Assessment
EMP	Environmental Management Project
EP3	Environmental Pollution Prevention Project
EPA	Environmental Protection Agency of the United States
EU	European Union
GDP	Gross Domestic Product
GEM	Projet GEM (Gestion de l'Energie dans les Entreprises Marocaines) (Energy Demand Management Project)
GLOBE	Global Learning and Observation to Benefit the Environment
GOM	Government of Morocco
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit German Agency for Technical Cooperation
ha	Hectares
IMPHOS	World Institute of Phosphate
km	Kilometers
m ³	Cubic Meter
MB	Market Based
MDH	Morocco Dirhams
mg/l	Milligrams per Liter
mm	Millimeter
NCE	National Council on the Environment
NEAP	National Environmental Action Plan
NGO	Nongovernmental Organization

NO _x	Nitrous Oxide Compounds
ONEP	Office National de l'Eau Potable
PRIDE	Project in Development and the Environment
PURS	Private Participation in Urban Services
PSA	Private Sector Assistance Project
RHUDO	Regional Housing and Urban Development Office
SIDE	Cellule Systeme Information et Donnees sur l'Environnement
SIS	Societe d'Ingénierie et de Systemes
SO _x	Sulfur Oxide Compounds
SSE/PE	Sous-Secretariat de l'Etat de l'Environnement Undersecretariat of State for the Environment
TFD	Training for Development
TRM	Tadla Resources Management
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific, and Cultural Organization
USAID	U.S. Agency for International Development
USETI	U.S. Environmental Training Institute of the Environmental Protection Agency
WHO	World Health Organization
WRI	World Resources Institute

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EXECUTIVE SUMMARY

USAID/Morocco has a comprehensive assistance program that focuses on agriculture, urban development, private sector development, natural resources management, and institutional strengthening. Although there is no explicit environmental focus, many projects have environmental components. By one estimate, approximately 30 percent of the mission's current efforts address environmental issues. To help organize this focus and to respond to USAID's environmental priorities, the mission requested assistance from the centrally funded Project in Development and the Environment (PRIDE) to help develop an environmental strategy. To do this, the PRIDE team examined the Government of Morocco's (GOM's) environmental concerns, the mission's current project portfolio, USAID's environmental strategic objectives, and relevant programs in Morocco funded by other donors. In addition, the team looked at major constraints that will affect the mission program in the future. From these assessments, the team developed recommendations for environmental activities that will meet the goals of the mission, USAID/Washington, and the GOM.

The proposed strategy is based on:

- Reinforcing and extending existing projects in the mission program;
- Proposing a range of activities from no additional to modest additional to larger funding;
- Maximizing the use of available mission, Asia and Near East (ANE) Bureau, and centrally funded programs;
- Avoiding duplication of aid from other international donors; and
- Responding to mission, ANE Bureau, and GOM environmental priorities.

On the basis of its assessments, the team chose three areas of concentration that underlie the mission's current program and reinforce, where possible, the existing projects. These concentration areas are:

- Pollution prevention
- Natural resources conservation
- Environmental awareness/information/education

To help the mission incorporate environmental concerns into its program, the team selected 17 actions for near-term consideration. This selection has four major criteria:

- Minimize burden on mission staff;
- Focus on existing projects;
- Leverage programs of other donors; and
- Have potentially large environmental and economic payoffs if successful.

The major efforts will support the development of clean technology/pollution prevention. This will include support to the GOM and the private sector. The government support will complement the World Bank Environmental Management Project (EMP) by providing U.S. expertise in developing an integrated environmental control network that combines the best aspects of command-and-control and market-based incentives. It will help update the National Environmental Legal Strategy, draft National Environmental Reference Laws, and develop pilot projects in one to three cities to test the concepts and demonstrate their performance. In addition, the strategy recommends conducting a pilot Comparative Risk Assessment of the Casablanca/Mohammedia corridor to identify and prioritize the major health problems, and to serve as a basis for an environmental health management strategy.

The private sector support will continue the support for the USAID-funded *Projet GEM* (*Gestion de l'Energie dans les Entreprises Marocaines* [Energy Demand Management Project]) in developing local technical capabilities in pollution prevention. This will include training engineers, conducting plant audits, supporting environmental businesses, disseminating pollution prevention information, and developing small-scale demonstrations. In addition, this component will include workshops and seminars to help the government privatization program improve the environmental performance and competitiveness of privatized firms through pollution prevention. Finally, this component will support environmental nongovernmental organizations in efforts such as recycling and participation in local and regional workshops.

Three activities will support environmental training: (1) conduct a comprehensive assessment of environmental information/awareness needs in Morocco, (2) support more environmental training activities in French under the Training for Development Project, and (3) provide environmental training through the Regional Housing and Urban Development Office (RHUDO) for National Upgrading Agency (ANHI) and municipal staff.

The final set of near-term activities involve natural resource management issues. These issues will be handled largely through the World Bank Environmental Management Project. USAID can assist these efforts by participating in efforts to scope Morocco's problems in preserving biodiversity of flora and fauna. A second possibility in this area is to extend current RHUDO efforts to promote urban agriculture.

In addition to these near-term activities, a number of longer-term activities were identified that will depend on developing additional major funding sources. Implementation of these will generally require major commitments of mission personnel and funds. These near- and long-term activities are summarized in the tables following, and are discussed in detail in the text of this report.

Recommended Near-Term Activities**Support Clean Technology/Pollution Prevention Activities**

- Help the GOM to develop an integrated environmental protection strategy
 - Update Environmental Legal Strategy
 - Develop draft National Reference Laws
 - Develop projects for one to three cities
 - Conduct comparative risk assessment for Casablanca/Mohammedia corridor
- Help the private sector develop an integrated environmental protection strategy
 - Support Projet GEM pollution prevention technical assistance
 - Assist privatization activities
 - Support NGO activities

Support Environmental Training/Information/Awareness

- Support environmental training in French through the Training for Development Project
- Support environmental assessment training for ANHI and municipal staff
- Assess environmental awareness needs

Support Natural Resource Management Activities

- Evaluate biodiversity problems
- Evaluate urban agriculture prospects in RHUDO activities

Recommended Long-Term Activities	
Support Clean Technology/Pollution Prevention Activities	
<ul style="list-style-type: none">• Develop Private Urban Environmental Services Project	
Support Environmental Training/Information/Awareness	
Support Natural Resource Conservation Activities	
<ul style="list-style-type: none">• Extend Tadra Resource Management Project• Develop water demand side management• Assist coastal zone management	

SECTION I

INTRODUCTION

SECTION I INTRODUCTION

A. Background for Evaluation

USAID/Morocco requested assistance from the centrally funded Project in Development and the Environment (PRIDE) to help develop a framework for its environmental strategy. The PRIDE team formulated an environmental strategy from an evaluation of the Government of Morocco's (GOM's) environmental concerns, the mission's current project portfolio, environmental objectives of USAID's Global and Asia and Near East (ANE) bureaus, and relevant programs in Morocco funded by other international donors. The strategy is founded on the broad objective of sustainable economic development with environmental protection. It draws on U.S. world leadership in clean technology/pollution prevention approaches and maximizes linkages among current mission projects.

Discussions with key mission and USAID/Washington personnel identified a number of constraints affecting an environmental strategy. First, the future of the mission in Morocco is uncertain, with a possible shutdown by the year 2000. This reduces the willingness of mission personnel to commit to long-term projects, and may reduce the funding for near-term projects as funds are husbanded to develop a trust fund to promote U.S.-Moroccan relations after mission shutdown. Second, major reductions in mission personnel, and probably funding, will continue over the next few years, drastically reducing the mission's ability to design and implement new programs. Third, the GOM only recently set up an environmental agency, the Undersecretariat of State for the Environment (SSE). The government is in the process of defining the responsibilities of the Undersecretariat and has a shortage of technically qualified staff able to manage major environmental programs. Finally, there is involvement in the environmental sector by other international donors in Morocco. Thus, USAID must ensure that its efforts support but do not duplicate these other efforts.

Considering these constraints, five guidelines were developed to help identify and evaluate strategy options. These include:

- Reinforce and extend existing projects in the mission program.
- Propose a range of activities from no additional to modest additional to larger funding.
- Maximize use of available mission, ANE Bureau, and centrally funded programs.

- Avoid duplication of aid from other international donors.
- Respond to mission, ANE, and GOM environmental priorities.

The GOM is currently defining the responsibilities of the Undersecretariat of State for the Environment. To support this effort, the World Bank is funding a \$6 million Environmental Management Project (EMP) to train Undersecretariat staff and institutionalize its programs. As a precursor to this effort, UNDP and UNESCO are providing \$800,000 to develop a National Environmental Strategy and a National Environmental Action Plan (NEAP). The Strategy will be largely operational, focusing on how the Undersecretariat and other Moroccan organizations will manage the environment. The NEAP will be both a policy and implementation document that identifies and prioritizes environmental concerns in Morocco, develops a strategic approach to these issues, and proposes action programs to implement them. In the absence of a formal national strategy and structural framework, various governmental agencies have analyzed their needs, developed programs, and pursued international donors on an individual basis; in fact, the international donor community, both bilateral and multilateral, is very active in Morocco in the environmental sector.

In view of these constraints and the current uncertainties within USAID regarding future funding and manpower, an environmental strategy should be considered as an initial effort to be reevaluated periodically as USAID resources and the resources and activities of the Moroccan government and other donors become better defined.

B. Development Approach to National Environmental Strategy

The team developed a set of Strategy guidelines and criteria through discussions with USAID staff and review of USAID documents.

B1. Strategy Guidelines

The action-oriented elements of the proposed environmental strategy are to:

- Respond to expressed Moroccan needs and priorities.
- Encourage communication and cooperation among mission projects.
- Complement activities of other donors.
- Draw on the strengths of U.S. environmental technology, particularly in pollution prevention.

B2. Operational Criteria

The following operational criteria were then applied:

- Reinforce and extend environmental projects in the mission's existing program.
- Propose a range of activities from no additional to modest additional to larger funding.
- Maximize the use of available mission, ANE, and centrally funded programs.
- Avoid duplication of efforts provided by other international donors.
- Respond to USAID environmental priorities at all agency levels.
- Focus on areas where the United States has specialized expertise, such as pollution prevention.

SECTION II

BACKGROUND

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SECTION II BACKGROUND

A. The Environment

Morocco is located at the northwestern extremity of Africa, across the Mediterranean Sea from Spain and is linked to Europe by the Straits of Gibraltar. The country is bounded on the west and north by the Atlantic Ocean and the Mediterranean Sea. Together the two bodies of water provide Morocco with a coastline of 3,446 km. To the south of Morocco is Mauritania and to the east is Algeria.

Morocco has a land surface of 710,850 km² and boasts four distinct climatic zones—coastal areas, interior plains, mountains, and desert. The interior plains and coastal areas enjoy a temperate Mediterranean climate; other areas experience wide variations in climate. Summers are hot and dry; spring and autumn rains are light and irregular. Precipitation diminishes from north to south and from west to east. In the northern mountains rainfall reaches more than 1,000 mm annually, whereas in the Sahara rainfall is less than 10 mm. These seasonal variations and irregular rainfall are major contributing factors to the nation's constrained water situation.

The country has eight major rivers, the most important being the Sebou. There are 43 large dams and myriad small and medium-sized barrages, all contributing significantly to Morocco's ability to stock water. Nonetheless, projections show that by the year 2000 some regions will suffer water shortages, and by the year 2020 the entire nation will have insufficient water to meet demand.

Morocco's 1992 population was estimated at about 26.2 million, with an overall annual population growth rate of 2.1 percent. Approximately 47 percent of the population lives in urban areas. Although Casablanca is the principal city and economic growth pole, the country has a number of significant secondary and tertiary cities and does not suffer from the "primary city" syndrome where one city completely dominates the urban sector. The government is supportive of the notion of growth poles and the need to invest in them to discourage migration to the Casablanca corridor. The urban population is growing at 3.1 percent annually, indicating moderate migration from rural to urban areas.

B. The Economy

The 1992 Gross Domestic Product (GDP) was MDH 242.5 billion (roughly US\$28.2 billion) or US\$1,100 GDP per capita (1992 prices and exchange rate). GDP growth during 1984-1990 averaged almost 5 percent per year, but with wide swings mainly because of poor weather conditions that severely affected the performance of the agricultural sector (drought during 1981-1985 and 1991-1992). GDP growth for 1993 is expected to be 10 to 12 percent. This high rate is a rebound rate reflecting the poor economic performance of 1992. Between

1988 and 1990, the inflation rate was approximately 4 percent. Unemployment, a potentially explosive problem, is 20 percent in urban areas, primarily concentrated among men 25 years and under.

Agriculture, forestry, and fisheries play a major role in the Moroccan economy, representing 14.1 percent of GDP. Agricultural exports comprise 26.4 percent of all exports (including processed agricultural goods). Approximately 50 percent of the population derives its livelihood from this sector. Primary products are cereals, citrus fruits, and sugar beets. The main exports are citrus fruits and fresh vegetables, mollusks, and fresh and canned fish.

The Moroccan government has pursued two kinds of agricultural policies:

- A policy of extensive irrigation to reach 1 million ha by the year 2000; and
- A policy of self-sufficiency in two major areas—cereal and sugar—maintaining artificially high prices in both commodities inside the country. This policy has done harm by distorting the efficient allocation of natural resources such as water and land.¹

The Moroccan manufacturing sector is extensive and diverse. It is concentrated in and around Casablanca where infrastructure is extensive and there exist economies of concentration. The sector produces mostly for the domestic market (18.3 percent of GDP). A quarter of its output is exported (higher for textiles and clothing and lower for phosphate-based products).

Mining and energy represent 6.7 percent of GDP. Morocco has the third largest reserves of phosphate in the world and exports of phosphate represent 7.7 percent of total exports. Morocco depends upon petroleum imports for more than 85 percent of its needs in energy. Coal production is minimal, 500,000 tons a year, and hydro-electric power is about 10 percent of total need.

Tourism is an important and promising growing sector in the Moroccan economy. It does, however, fluctuate dramatically depending on the political climate in the Middle East. In 1992, tourism represented 4.9 percent of GDP and contributes significantly to foreign exchange earnings.

C. The Legal, Regulatory, and Institutional Framework

This subsection presents a brief overview of new development in the legal, regulatory, and institutional environment.

¹ Of the 9.2 million ha of cultivable land, 75 percent is cultivated. Of this 75 percent, 73 percent was for cereal (1991/1992). Ninety percent of water resources is for agricultural irrigation.

C1. Legal and Regulatory Framework

Morocco does not have a single and coherent environmental code. The existing body of Moroccan laws and regulations on the environment is scattered among various institutional texts. By one estimate, 350 separate laws have major environmental components. These texts have been promulgated over a long period of time, mostly in the early 20th century, which makes them difficult to identify, collect, and interpret. The overall impression is one of a patchwork quilt with many holes. In addition, these laws and regulations tend to be antiquated, overly bureaucratic, and inflexible. The government needs a coherent set of environmental laws and implementing regulations.

In the Undersecretariat of State for the Environment, the Regulatory and Control Division is in charge of compiling, by thematic topic, 4,500 pages regrouping 500 legal texts that have environmental components. Two domestic consulting firms are assisting in this work; one is working with the legal environment, and the other is working with the institutional environment. The purpose of this work is to develop a computerized data bank in order to study these laws and eliminate or reformulate those that are inadequate, inconsistent, or obsolete.²

In the meantime, a draft Law on the Environment (*Projet de Loi sur la Protection et Mise en Valeur de l'Environnement*), prepared in 1985 and updated in 1993, is ready for Parliamentary enactment. This draft law will provide general principles for environmental management and protection and constitute a coherent legal framework for the environment. However, the law is not self-executing and will require specific regulations for its application (*decrets d'application*).

In addition to this law, two other self-executing laws under the general framework are planned. They are a chemical law and the Permit Law for Integrated Pollution Control. The chemical law uses a command-and-control (CAC) approach that prescribes specific control technologies and practices and will be used to restrict the uses of hazardous chemicals based on international practices and standards (based mostly on European Union practices). The chemical law provides for development of specific standards and allows courts to penalize violators. The Permit Law for Integrated Pollution Control will use the roll-back approach to reduce current emissions and will negotiate pollution contracts between polluters for water discharges, air emissions, and waste production from point sources. The two laws are being prepared in conjunction with the World Bank and the German Agency for Technical Cooperation (GTZ).

Neither of these approaches promotes market-based (MB) incentives to encourage polluters to lower costs through technologies and practices that are also less polluting. The

² The "Societe d'Ingénierie et de Systemes," 8 rue Sanaa Rabat, tel: (70-97-27, fax: 70-61-79) is the consulting firm working with legal matters. Its general director is Mohamed El Rhazi. Imeg-Consultants is the firm working with institutional matters. It is situated at 2 rue Medyouma Aviation Rabat (tel: 65-62-85, fax: 75-83-88), and its director is Abdelahad Fassi Fehri.

MB approaches encourage pollution prevention techniques such as recycling, conservation (including energy), improved processes, use of less toxic raw materials, and waste minimization. Experience shows that 20 to 60 percent of the pollutants emitted from typical plants can be eliminated by these approaches at little or no cost to the plant, or through investments that pay back in a year or less. Because these pollution prevention techniques save money for the plant owners, they are self-enforcing and do not require a bureaucracy to enforce, but only require information on what the techniques are and how to implement them in their plants.

C2. Institutional Framework

Development of the institutional framework for environmental management is part of the World Bank's Environmental Management Project. Although it has not been finalized, the overall structure of the project will likely resemble the following:

- The Undersecretariat of State for the Environment
- The National Council on the Environment (NCE) (which will have regional and local counterparts)
- The environmental section in each ministry

C2a. The Undersecretariat of State for the Environment

The Undersecretariat of State for the Environment was placed within the Ministry of the Interior and Information in 1992. It is a flexible organization with three divisions:

- Studies and Coordination
- Control and Regulation
- Awareness, Communications and Training

The Studies and Coordination Division is divided into three departments:

- Coordination and Cooperation
- Research and Studies
- Program Development and Project Monitoring

The Coordination and Cooperation Department houses the National Council on the Environment, the International Cooperation Office, and the Emergency Planning Office.

The Research and Studies Department houses the National Laboratory and the Environmental Institute (Observatoire de l'Environnement), which is composed of five sections:

- Management and Administration (Cellule Gestion et Administration)
- Audit and Evaluation Studies (Cellule Etudes d'Evaluation et Audits)

- Environmental Data and Information System (Cellule Systeme Information et Donnees sur l'Environnement)
- Environmental Impact Studies (Cellule Etudes d'Impact sur l'Environnement)
- Desertification and Biodiversity (Cellule Biodiversite and Desertification)

The National Strategy for the Protection of the Environment is being developed under the aegis of the National Laboratory and the Environmental Institute, with financing provided by UNDP/UNESCO. UNDP is also funding the National Environmental Action Plan (through the Capacity 21 Fund). The Strategy should be completed in early January 1995, and the Plan should be finalized by late 1994.

Functions of the Division of Control and Regulation are described in subsection C above on the legal and regulatory framework. The Division comprises two departments—Regulation and Control. The third division is the Division of Awareness, Communications and Training, which consists of two departments: Public Information and Awareness, and Training and Education. This Division is also responsible for liaison with environmental nongovernmental organizations (NGOs).

C2b. The National Council on the Environment

The NCE was created in the early 1980s but never found an effective role for itself. It was a conditionality of the World Bank to revamp the NCE before the Environmental Management Project got under way. The NCE is an environmental policy body composed of representatives of relevant ministries. Its final composition is not yet set and there is a possibility that NGOs will be included in the Council.

C2c. Environmental Sections of Ministries

Each ministry has an environmental section created to provide a liaison between the ministry and the Undersecretariat of State for the Environment concerning environmental matters within the ministry. Each section is directed by an environmental advisor to the minister. The structure of the environmental section varies among ministries but general emphasis is on a small staff and a quick and flexible response to environmental problems.

SECTION III

ENVIRONMENTAL ISSUES IN MOROCCO

SECTION III

ENVIRONMENTAL ISSUES IN MOROCCO

A summary of environmental issues in Morocco was developed by reviewing reports and assessments prepared by the USAID, GOM, World Bank, UNDP, and other organizations, and through discussions with key personnel from these organizations. Environmental issues are grouped into three major areas:

- What is the key threat to the environmental underpinnings of the economy? Is it unsustainable exploitation of resources or environmental degradation, or both?
- What are the key threats to public health?
- What are the key threats to critical natural and human ecological systems?

The table below lists major environmental concerns that are discussed in the following subsections.

Table III-1
Major Environmental Issues in Morocco

Threats to Environmental Foundations of Sustainable Economic Development
<ul style="list-style-type: none">• Decrease in water availability and quality• Soil degradation (including erosion and desertification)• Agricultural pollution• Coastal degradation
Threats to Public Health
<ul style="list-style-type: none">• Degradation of the urban environment• Industrial pollution• Air pollution
Threats to Natural Resources and Ecological Systems
<ul style="list-style-type: none">• Degradation of forests and watersheds• Loss of fauna and flora

A. Threats to the Environmental Foundations of Sustainable Economic Development**A1. Decrease in Water Availability and Quality**

Morocco has limited water resources, of which 90 percent is now exploited. The annual renewable volume of water is 30 billion m³, of which only 11 billion m³ are accessible. Of this amount, 92 percent is used for agriculture and 8 percent for industrial and domestic purposes: demand for the latter is growing by 8 percent per year. By the year 2000, the water balance deficit will be regionally significant and by 2020, Morocco will suffer a national water shortage. Industrial and domestic pollution makes a portion of available water unusable and is most serious in the surface waters of the major river basins, whereas pollution from domestic and agricultural wastes affects groundwater quality and even rural artesian wells.

A2. Soil Degradation

Soil degradation is caused by erosion, desertification, salinization, waterlogging, or pollutant contamination. Of these, soil erosion is the most far-reaching. One-third of agricultural lands, about 12.5 million ha, is menaced by erosion, seriously affecting mountain agriculture and pastoral activities. The most vulnerable areas include the Rif mountains, the Rif watershed of the Sebou River, and the Nekkour basin. In these zones, the annual loss of soil is 4,000 to 6,000 tons/km², the highest rate of soil erosion in North Africa. The principal causes are overgrazing, accelerating deforestation, and inappropriate agricultural practices. Soil erosion also leads to a sedimentation rate of 50 million m³/yr, resulting in a decrease in dam capacity of 0.4 percent per year and an annual loss of 5,000 hectares of agricultural land.

A3. Agricultural Pollution

Agricultural pollution has resulted from the overuse of fertilizers, pesticides, insecticides, and fungicides, stressing both surface and groundwater resources. Approximately 95 percent of the surface water and 85 percent of the groundwater are used for irrigation. The contamination level is about 10,000 tons/year of phosphates and nitrates. In some aquifers the nitrate concentration has surpassed the World Health Organization standard for drinking water of 50 mg/l. Phosphates are finding their way into surface waters, causing eutrophication and massive algal blooms, killing fish and other aquatic life. Fertilizer plants, particularly in Safi, discharge dangerous quantities of hazardous waste, especially uranium and cadmium. The use of polluted water for irrigation, in addition to decreasing the productive capacity of the soil, has indirect impacts on human health.

A4. Coastal Degradation

Coastal degradation has occurred largely because of direct and indirect waste disposal practices. The marine environment receives 98,000 tons of oxidizable matter each year from the seven major river basins. The majority is centralized along the central Atlantic coast between Casablanca and Kenitra, the zone of heaviest urban and industrial development. Also, most coastal cities dump most of the untreated domestic and industrial wastes directly into the coastal waters (in some cases pumping it up to 1/2 km offshore), which often wash back onto the beaches. The situation has a major effect on human health and a significant economic impact on tourism and fisheries.

B. Threats to Public Health

B1. Degradation of Urban Environment

Degradation of the urban environment is caused largely by the lack of sewerage and wastewater treatment systems in urban areas, and to the extensive spread in these same areas of *bidonvilles* and clandestine housing areas without sanitary or social infrastructure. There are presently no operating wastewater treatment facilities in Morocco. This problem is increasing rapidly because of an urban growth rate reaching 4.6 percent per year in some regions. In addition, the annual accumulation of 6 million tons of untreated solid waste, improperly disposed of so that it leaches into soil and water resources, is a major urban pollution problem. Because many urban areas are along the coastline or on major rivers, pollution of riverine and marine environments is exacerbated. The problem is particularly acute in the ancient medinas of the principal cities, which suffer from an inadequate environmental infrastructure and a deteriorating residential environment.

B2. Industrial Pollution of Water and Air

Industrial pollution of water and air is currently limited to several industrial poles—the Casablanca/Mohamedia corridor in which heavy industry and power plants are found, the Atlantic coast north of Agadir, and along the Sebou River. Forty percent of the industries in Kenitra and Fes discharge their waste into the Sebou. An estimated 10,000 tons of industrial effluents are discharged yearly into two major river systems, the Sebou and the Oum Rabia, including toxic chromates from the tanning industry and large concentrations of materials with high chemical oxygen demand. In the large cities, industrial liquid waste is usually dumped into municipal sewers and then into the natural environment without treatment. A 1982 study found high concentrations of heavy metals such as mercury and pesticides in fish and shellfish in Moroccan coastal waters. A severe problem also exists with toxic and hazardous materials and wastes, with no national strategy and no facilities for their storage or disposal.

Air pollution such as carbon monoxide (CO), sulfur oxide compounds (SO_x), nitrous oxide compounds (NO_x), hydrocarbons, and particulates in the large cities (especially the Casablanca/Rabat corridor) is caused primarily by industrial development and large numbers of vehicles that use diesel and leaded fuel and have no emission control devices. Industrial

air pollution is caused primarily by cement and power plants and inefficient industrial boilers. In urban areas, air pollution is caused largely by urban transport. A recent study showed CO in Casablanca exceeded maximum recommended levels (9ppm/8hrs) in more than 50 percent of the measurements, and NO_x levels were exceeded in 40 percent of the measurements. Lead emissions resulting from the combustion of leaded gasoline are estimated at 100 tons/year, and may pose a significant health hazard, especially to children.

C. Threats to Natural Resources and Ecological Systems

C1. Degradation to Forests and Watersheds

The forested areas of Morocco comprise 9 million ha, of which 5 million is natural forest. Because of unsuitable agricultural and forestry practices, the deforestation rate is estimated at 50,000 ha per year. Wood consumption for domestic use exceeds by three times reforestation programs undertaken by the Ministry of Agriculture. Erosion affects as much as 12.4 million hectares, and contributes to sedimentation that is decreasing reservoir volume for irrigation and power generation by 0.4 percent/year. Related problems include salinization of rainfed reservoirs.

C2. Loss of Fauna and Flora

Loss of fauna and flora in Morocco, which has a rich biodiversity because of its varied climatology and topography, is caused by urbanization, pollution of surface waters, and overgrazing of forest resources that leads to destruction of forest undergrowth and the invasion of grassland. Like deforestation, these practices mean the loss of wildlife habitat. However, the most significant causes of wildlife destruction are hunting and abusive fishing operations. Forty mammal species of 100 identified and 45 of 2,000 bird species have recently become extinct in Morocco.

SECTION IV

ENVIRONMENTAL ACTIVITIES OF INTERNATIONAL DONORS

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ENVIRONMENTAL ACTIVITIES OF INTERNATIONAL DONORS

Morocco has a large and active international donor community, and a significant portion of the bilateral and multilateral aid to the country is oriented toward environmental projects. The narrative that follows summarizes relevant existing and proposed environmental projects funded by these donors. The following is by no means an exhaustive list of the current environmental portfolio of the international donors.

The purpose of this exercise is to determine areas where USAID might "piggyback" or complement some of these projects or find its own niche, and ensure that there is no duplication or overlap of services.

In 1992, Morocco received \$750 million in international aid, of which roughly two-thirds were concessionary loans and one-third was grants (UNDP nomenclature). The total amount of international aid for 1993 was not identified at the time of this study. The principal actors in the environmental arena include multilaterals (the World Bank, the United Nations, the European Union, and the African Development Bank) and bilaterals (Caisse Française de Development, GTZ, and USAID).

A. The World Bank

The World Bank, through its Environmental Management Project, is lending the Moroccan government \$6 million over four years to strengthen its Undersecretariat of State for the Environment. This loan will fund the hiring and training of Undersecretariat personnel, support development of environmental groups in the ministries of Agriculture and Public Works, help review and update environmental laws and regulations, help develop an enforcement/compliance system, and establish a National Environment Information Network. This World Bank project will likely be the primary focus of environmental policy development in the Moroccan government.

The Bank also began an irrigation project aimed at improving water management in large perimeters (Projet d'Assainissement des Grands Perimetres Irrigues, PAGI II, \$320 to \$340 million), and is beginning discussions on wastewater and solid waste treatment facilities in the major Moroccan cities.

B. The United Nations

UNDP/UNESCO is financing the National Strategy for the Protection of the Environment through the National Laboratory and the Environmental Institute (housed within the Undersecretariat of State for the Environment). This \$800,000 grant is being used as a precursor to the World Bank loan discussed above, laying the groundwork for many activities the loan will continue to support, and will include baseline environmental assessments for

two of the seven provinces. The National Strategy is expected to be completed by early 1995.

Other UNDP assistance includes:

- Financing the National Environmental Action Plan through the Capacity 21 Fund;
- Financing a documentation center in the GTZ-supported National Laboratory for Pollution Study and Monitoring;
- Financing a project to develop environmental curricula in the school system and to "train the trainers" (FNUAP/UNESCO—the U.N. Population Fund);
- Developing with UNEP the Biodiversity Project financed by the Global Environment Facility;
- Organizing and partially funding an interactive computerized databank, "Sustainable Development Network for the Environment"; and
- Developing two new projects—a national plan for potable water and a cell genetic conservation project.

C. The European Union

European Union environmental projects in Morocco include:

- Financing a remote sensing project (technology transfer) to help the Centre Royal de Teledetection monitor Moroccan forest resources and crops, and to help build a coastal management database to remotely sense marine upwellings to better locate fisheries and to increase the use of algae as a marketable product (a grant of 4 million ecus);
- Providing a grant of 125 million ecus plus a loan of 500 million of ecus from the European Bank for Investment (BEI) to finance environment projects. Priority sectors are wastewater from coastal cities and hazardous/toxic industrial waste management;
- Providing a grant of 1.1 million ecus to the World Institute of Phosphate (IMPHOS) at Casablanca, to study new technology to reduce cadmium from phosphoric acid; and
- Providing a grant of 370,000 ecus for a wetland education center in Sidi Bouraka, and, together with UNDP, a grant of 290,000 ecus for the National Plan for Liquid Waste Management.

Two additional projects are in preparation. One is a demonstration project under the World Bank Environmental Management Project on how to handle the olive oil processing wastes from a group of mills in Dokkarat (2 million ecus), and the other is a communal management plan for ecosystems in the Rif forests (2 million ecus).

In addition, the Moroccans have presented three more projects for potential funding:

- Refining a Management Plan for National Parks by the Direction des Eaux et Forets et de la Conservation des Sols in the Ministry of Agriculture;
- Training an emergency team to clean oil spills by the Administration de l'Hydraulique in the Ministry of Public Works; and
- Developing a land use management plan for the Mediterranean coastline.

D. The African Development Bank

The African Development Bank is financing a natural resources conservation project that addresses the problem of wood supply for multiple uses and cattle forage. The Bank is also preparing to finance three medium-sized dams deemed necessary to remedy a chronic water deficit in the Guerdane area (citrus fruit growing area) and the Beht perimeter, as well as water supply for the cities of Khemisset and Tiflet. Bank policy requires environmental assessments for the dams before releasing the financing. The Moroccan government is seeking funding to perform these environmental assessments.

E. Caisse Française de Development

The Caisse Française de Development (CFD) finances and supervises projects through concessionary loans and grants from the French Ministry of Foreign Affairs. Current projects are:

In the water sector:

- Creation of a database and development of remote sensing for a pilot project of potable water in rural areas;
- Pollution control of the Sebou River;
- Preliminary design of works to protect and manage watersheds;
- Various studies and technical assistance on water quality; a pilot project concerning clean-up of the Bou Regreg, Sebou, and Inaouene rivers; and the organization of a water quality laboratory;
- Support for water treatment plants in Fes (three plants) and Sidi Boushab in Agadir; and

- Pilot projects in Agadir, Fes, Oujda, and Temara on the reuse of grey water and on lagoon rehabilitation in Marrakech.

In the solid waste management sector:

- Pilot projects on urban solid waste management in Agadir, Meknes, Oukja, Rabat, and Casablanca.

In the urban development sector:

- A project similar to the RHUDO HG-4 project in Ben Souda (Fes).

F. German Agency for Technical Cooperation

The German government has an annual technical assistance budget in Morocco of DM 30 million (US\$19 million). Its program includes seven major environmental activities:

- Assist the Office National de l'Eau Potable (ONEP) to develop wellhead protection zones and implementation guidelines to protect aquifers and groundwater resources around large dams.
- Train technicians at agricultural extension centers nationwide in improved pesticide application.
- Institute erosion protection through a replanting program in the mid-Atlas mountains and a social forestry project in Ouarzazate. The latter is an attempt to influence the people of the region not to harvest all wood resources in order to halt desertification. A companion program through the Near East Foundation attempts to introduce solar cookers in place of fuelwood.
- Develop management plans for existing national parks and strategies for the development of new ones. A companion inventory and designation of proposed parks and reserves is being conducted by a French consulting firm with funding from the African Development Bank.
- Support ONEP in establishing a unit tasked with planning and operating sewage treatment plants in small cities (this is a follow-on to a similar project with potable water treatment).
- Introduce the concept of renewable energy supply through the dissemination of photovoltaic equipment for electric generation. This pilot project in Kenitra will likely evolve into a nationwide program managed by CDER.
- Provide a wide range of environmental management activities, including:

- Introducing enforceable environmental standards for municipal and industrial water quality;
- Establishing a national environmental laboratory;
- Drafting pollution control laws;
- Developing an environmental awareness strategy for Morocco and implementing some proposed activities; and
- Providing institutional strengthening in "brown" technology management for Undersecretariat managerial staff;

SECTION V

USAID/MOROCCO ENVIRONMENTAL STRATEGY

SECTION V

USAID/MOROCCO ENVIRONMENTAL STRATEGY

This section has three parts. The first part describes the environmental strategies of USAID/Washington and the ANE Bureau. The second part describes the existing mission portfolio and focuses on projects that have an explicit or implicit environmental component. The third part characterizes the proposed Environmental Action Plan.

A. USAID/Washington and ANE Bureau Strategic Framework

Because we live in an era of profound and constant change, USAID recently undertook to redefine its mission and revise its charter. The Agency redefined its long-term objectives and developed an integrated approach to describe the manner in which those objectives will be pursued. The Agency developed a set of strategies for sustainable development and is currently developing implementing guidelines.

USAID has determined to support programs in four areas fundamental to sustainable development. They are:

- Population and health
- Broad-based economic growth
- Democracy
- Environment

These four areas are very interrelated; lack of progress in one negatively impacts the other three. A good example is rapid and unsustainable population growth, which consumes economic gains, hastens environmental destruction, and creates social unrest. Because the assignment is to assist the mission in Morocco to develop its environmental strategy, only the fourth consideration is herein expanded. It is important to keep in mind, however, that the four areas are interrelated and an approach to one should be integrated within an approach to all.

USAID also intends to employ the following operational methods in all of its programs:

- Support for sustainable and participatory development
- Emphasis on partnerships with other donors
- Use of integrated approaches

These operational guidelines include leveraging funds, supporting the expansion of NGOs into development work, and integrating the needs and participation of women into development programs.

A1. USAID's Strategy for Environmental Protection

In its environmental strategy, USAID intends to pursue two strategic goals: (1) to reduce long-term threats to the global environment, and (2) to promote economic growth at the local, regional, and national levels by addressing unsustainable environmental, economic, and developmental practices. Particular attention will be paid on a global basis to two issues: (1) climate change and the growing sources and diminishing sinks of greenhouse gas emissions, and (2) impoverishment of the planet's biological diversity.

At the local level, USAID strategy will focus on:

- Impairment of health caused by air, water, and soil contamination from industrial, agricultural, and household activity;
- Unsustainable exploitation of forests, wetlands, coastal zones, coral reefs, and other fragile ecosystems;
- Degradation and depletion of water resources;
- Unsustainable agricultural practices;
- Inefficient and environmentally unsound energy production and use;
- Inadequate management of household and municipal wastes in growing urban areas;
- Regulatory, statutory, enforcement, and policy issues; and
- Social and economic patterns, including lack of participation and empowerment.

A2. ANE Bureau Environmental Strategy

The ANE Bureau developed a strategic environmental framework in 1992. Although it was developed prior to the Agency's environmental strategy, the Bureau strategy contains many of the same themes and fits well with it. The Bureau strategy provides more detail than the Agency's and addresses implementation issues that the Agency strategy does not. Four priority issues form the core of the Bureau's strategy. They include:

- Degradation and depletion of water resources
- Urban and industrial pollution
- Environmentally unsound energy production and use
- Unsustainable agricultural practices

In early 1993, the Bureau determined that its environmental strategy would concentrate on issues related to water conservation and water quality. USAID/Morocco's portfolio responds well to these concerns.

B. Environmental Components of Existing Mission Programs

Although the mission has no program that is purely environmental, existing nonenvironmental programs have significant environment components. In addition, one modest environmental project, a buy-in to the PRIDE project, provides assistance to five separate private sector mission projects. The current mission portfolio is summarized in Table V-1.

Mission programs can be grouped in the following areas:

- Agriculture
- Urban development
- Private sector development
- Natural resources management
- Institutional and policy strengthening

These program areas are discussed below.

B1. Agriculture

The principal undertaking in this category is the Tadla Resources Management (TRM) Project, an irrigation project in the Tadla perimeter of the second largest river basin in the country. The Moroccan government has invested heavily in water infrastructure but there is much waste in the system. The TRM project intends to increase irrigation system efficiency, reduce water-related environmental problems (such as salinization, waterlogging, and inappropriate pesticide application) and increase on-farm water efficiency. The project has an interesting derivation, having started as a watershed management project in the mountains and ending up as an irrigation project in the plain. The watershed project looked at a variety of concerns including forestry and agroforestry.

The other major agricultural project is the Morocco Agribusiness Promotion Project. Although it has no specific environmental component, the project has a part of the PRIDE buy-in that will develop a paper to be published in a major Moroccan business publication (*L'Economiste*) on opportunities for pollution prevention in the Moroccan agribusiness sector. There is also a current effort to introduce an integrated pest management component to deal with pesticide residues and market standards.

Table V-1
Portfolio of USAID/Morocco Projects Beyond FY94

Code	Projects	PACD	Projected Budget \$m	General Description	Major Environmental Accomplishments
0913	GEM (EDM-CTPP) Energy Demand	9-1995	8.6	Goal: Save foreign exchange, increase productivity by reducing energy waste and improving efficiency of energy use. Components: (1) Information and awareness campaign, (2) firm-specific audits and technical feasibility studies of investments, (3) demonstration projects, (4) U.S. and in-country training, and (5) policy analysis on taxation and standards.	PRIDE buy-in. Provide energy audits and boiler tune-ups to increase energy usage efficiency.
	CTPP Clean Technology Pollution Prevention	9-1995	0.7	Goals: (1) Promote cleaner production in the Moroccan industrial sector. (2) Ensure sustainability of clean production projects through the creation of a market for clean production services and equipment. (3) Develop linkages between the Moroccan industrial sector and U.S. manufacturers.	Train EDM engineers in environmental auditing to increase the overall efficiency of inputs and decrease waste.
0215	Privatization	8-1997	25	Goal: Improve substantially the climate for private sector investment, domestic and foreign. Purpose: To motivate the GOM to move expeditiously on implementing its privatization program.	PRIDE buy-in. Environmental awareness seminar in the sugar industry.
0219	AIM (IESC) Accessing International Markets	7-1997	10.4	Goal: Improve marketing, product design, packaging, production processes, exports, and overall management of Moroccan export industry. Implemented by the International Executive Service Corps. Components: (1) Technical assistance, (2) link between U.S. and Moroccan businesses to increase trade, and (3) pilot tourism promotion program to increase U.S. tourism to Morocco.	PRIDE buy-in. Help companies solve acute environmental problems. Assess potential environmental liabilities through environmental audits, recommend operational/energy efficiency, and support pollution prevention methods.
0214	NED New Enterprise Development	8-1997	16	Goal: Reduce constraints faced by SMEs. Components: (1) Business support services, Centre de l'Entreprise du Maroc; (2) organizational and administrative reform; and (3) SME financing.	PRIDE buy-in. Increase environmental awareness of SMEs through TA and training workshops. Establish long-term environmental unit in CEM.
0210	MAP Moroccan Agri- business Promotion	6-1998	20	Goal: Help Morocco develop and maintain its competitiveness. Purpose: Provide direct assistance to Moroccan agribusinesses to research markets. Components: (1) Promote agribusiness products, trade, and exports; (2) reduce or remove regulatory and administrative obstacles; (3) strengthen the competitiveness of private sector; and (4) develop human resources for agribusiness.	PRIDE buy-in. Develop an article on pollution prevention in the food processing industry.

Code	Projects	PACD	Projected Budget \$m	General Description	Major Environmental Accomplishments
0210	MAP Moroccan Agri-business Promotion	6-1998	20	Goal: Help Morocco develop and maintain its competitiveness. Purpose: Provide direct assistance to Moroccan agribusinesses to research markets. Components: (1) Promote agribusiness products, trade, and exports; (2) reduce or remove regulatory and administrative obstacles; (3) strengthen the competitiveness of private sector; and (4) develop human resources for agribusiness.	PRIDE buy-in. Develop an article on pollution prevention in the food processing industry.
0213	TRM Tadla Resources Management	9-1998	10.6	Goal: Promote long-term competitiveness and environmental sustainability. Purpose: Increase the efficiency, economic yield, and environmental sustainability of irrigation resources, management and use. Components: (1) Improve irrigation system management; (2) improve on-farm management; (3) strengthen private sector; (4) support sustainable environmental management: waterlogging, salinization, and water and soil degradation from inappropriate water and soil management, misuse, and mismanagement of agrochemical, and agro-industrial pollution.	Water conservation project. Reduce water-related environmental problems such as salinization, water-logging, and inappropriate pesticide application.
0214	DSTS Development Studies Technical Services	9-1998	10	Goal: Enhance effectiveness of USAID economic assistance program for Morocco. The project supports the identification and development of new policy strategies and project initiatives.	
0208	TFD Training for Development	9-1999	28	Goal: Strengthen the capacity of local training institutions to respond to private sector needs. Support short- and long-term training in the United States.	Provide environment seminars.
0198 0223	Family Planning IV Family Planning V POP Global/Regional	8-1996 12-1999	24 52 3	Goal: Improve the health of children under 5 and women of childbearing age. Purposes: (1) Increase the use of family planning/mother and child services; and (2) increase program sustainability by ensuring a favorable policy environment, reinforced decentralized institutional capacity, and diversified resource base.	Reduce population pressure on environment.

B2. Urban Development

The Regional Housing and Urban Development Office (RHUDO) portfolio consists of a series of programs in collaboration with the National Upgrading Agency (ANHI) that provide slum and clandestine housing area upgrading, land development for low-income housing in order to resettle *bidonville* residents, and environmental infrastructure and services in these areas. The latter have included sewerage, water, electricity, and roads provision, as well as support for sewerage master plans and privatization of municipal solid waste disposal facilities. USAID/Morocco requires ANHI to prepare environmental impact assessments (EIAs) for all new projects and, toward that end, USAID will support a project in EIA training for both ANHI and municipal office staff.

B3. Private Sector Development

The primary private sector project is Projet GEM (Gestion de l'Energie dans les Entreprises Marocaines [Energy Demand Management Project]). This project was developed to provide energy conservation services to Moroccan industry on a sustainable basis. The project trained Moroccan engineers to provide technical assistance, such as energy audits, boiler tune-ups, and similar energy management services, and subsidized these activities in the initial years until Moroccan industry could see the benefits and would be willing to pay for the services. A clean technology/pollution prevention component was recently added to the project. This component will provide environmental assessments and identify pollution prevention opportunities. Although the benefits to the plants audited are determined in terms of cost savings, increasing energy efficiency and decreasing effluents are clearly beneficial to the environment.

Another project is New Enterprise Development (DYNA-PME), which supports the development of small and medium-sized business enterprises. A major component is the Centre de l'Entreprise du Maroc (CEM) in Casablanca. This component provides a variety of business support activities such as helping to develop business plans and arranging financing. The component also supports women entrepreneurs and NGOs, specifically a woman-run paper recycling cooperative, Je Recycle. CEM is undergoing a major restructuring. A PRIDE assessment developed a strategy for CEM to tap the nascent environmental market opportunities in Morocco.

A third project, Accessing International Markets, increases trade linkages between Moroccan and American businesses by providing expert technical assistance through the International Executive Service Corps. The project also has a component through the PRIDE buy-in to provide plant audits and other environmental management services.

A final project (Privatization Sector Assistance) supports the government's privatization efforts. It provides a resident technical advisor to assist the government in privatizing the state-owned industries. At present, little attention is being paid in these privatizations to environmental consequences. Pollution prevention activities that improve plant cash flow while reducing emissions will potentially increase the financial attractiveness

to potential buyers and reduce their concerns about possible future environmental regulations. This project also has a component under the PRIDE buy-in to provide workshops on the environmental impacts of privatization on specific sectors.

B4. Natural Resources Management Practices

A Peace Corps project—Parks, Wildlife and Environmental Education—began in 1985 in cooperation with the Ministry of Agriculture. Volunteers work in national parks or other natural areas assisting in the development of management plans, conducting biological and sociological surveys, providing environmental education, and coordinating with international environmental NGOs. The U.S. Fish and Wildlife Service and USAID provide technical and financial assistance.

B5. Institutional and Policy Strengthening

This category includes two projects that have funds available for environmental activities—Training for Development (TFD) and Development Studies and Technical Support (DSTS). Most TFD project activities are linked to the private sector role in economic development: the project has sponsored activities related to privatizing municipal environmental services. Training will be provided to this program under the aegis of the U.S. Environmental Protection Agency's Environmental Training Institute. DSTS funds are available to the Moroccan government, the private sector, and USAID for activities related to economic and social policy reform. Through DSTS, USAID financed part of the World Bank prefeasibility study for the Environmental Management Project and will soon do an analysis of the CDER in Marrakech.

C. Proposed Environmental Action Plan

Based on the analyses and discussions summarized in the previous sections, the team identified a number of opportunities for USAID/Morocco assistance. These are grouped in the mission portfolio's three priority areas:

- Clean technology/pollution prevention
- Natural resources management
- Education/awareness and institution building

The projects (summarized in Table V-2) span a variety of short- and long-term efforts, funding requirements, and implementation requirements. The table lists the type of assistance the proposed effort provides (training, technical), the program it relates to (mission, ANE Bureau, Global Bureau), and which PRISM outcomes are affected. Finally, the table explains the purpose of each proposed action.

C1. Clean Technology/Pollution Prevention

The clean technology/pollution prevention area offers many important opportunities for mission assistance. These include:

C1a. Help the GOM Develop an Integrated Industrial Environmental Protection Policy

The GOM is currently developing policies, regulations, and standards for industry. Meetings with GOM and UNDP staff indicated intense interest in developing a regulatory scheme that balances CAC and MB approaches so that the environment is protected in the most economically efficient way. The World Bank Environmental Management Project and UNDP will begin to develop these approaches in the next 6 to 18 months. The policies, regulations, and institutions developed will affect industry and public health and welfare for decades to come. However, GOM and UNDP staff believe they do not have the expertise needed to develop a regulatory regime to properly balance the two approaches. They would like USAID assistance that includes:

- Reviewing scopes of work for comprehensive industry sector studies soon to be initiated, and reviewing interim and final reports to ensure these properly evaluate and balance the two regulatory approaches;
- Updating the Moroccan Environmental Legal Strategy to help make it a more practical document with specific emphasis on linking CAC and MB approaches within the Moroccan legal culture, identifying market incentives, prioritizing sectors, developing the technical foundations of a management system, and specifying the roles of monitoring and sanctions;
- Developing a set of draft national reference laws that integrate CAC and MB approaches to serve as a baseline that can be fine-tuned through further analyses and discussions. This two-phase effort will first prioritize the sectors, examine market incentive options, characterize management needs, perform cost/benefit analyses, and recommend interim standards. The second phase will develop reference laws for air and water discharges, environmental impact assessments, and hazardous waste management. These reference laws will be coordinated with ongoing efforts to develop national strategies in these areas;
- Implementing pilot projects in one or more cities (the UNDP project suggests Rabat, Safi, and/or Marrakesh) to test and demonstrate the concepts as a precursor to full national implementation. This will include assisting local governments to develop local institutions and train local staff to develop procedures and standards and implement the programs, conducting environmental audits of plants, assisting local businesses to comply, and monitoring the results; and
- Conducting a pilot Comparative Risk Assessment (CRA) for the Casablanca/Mohammedia corridor. This major industrial area is the source of much air, water, and solid effluents in Morocco. A CRA similar to one USAID conducted for Cairo will develop quantitative evaluations of the health impacts of major pollutants and develop priorities for environmental strategies. This will help municipal and national governments determine priorities and will serve as a

basis for their environmental control strategies. It may be possible to conduct a CRA for the Casablanca-Mohammedia corridor using existing data. A reconnaissance mission is needed to determine what information exists and whether a reasonable CRA can be performed without collecting substantial amounts of additional data.

This effort will complement the World Bank Environmental Management Project by providing it with expertise in combining CAC and MB that is not available from another donor. In particular, U.S. expertise in clean technology/pollution prevention approaches will develop an integrated approach that compared with the traditional CAC and rollback approaches likely to be used will be more effective, less expensive, and politically more palatable to industry.

C1b. Help the Private Sector Identify and Implement Clean Technology/ Pollution Prevention Opportunities

The second thrust in the mission's clean technology/pollution prevention effort will support private sector implementation, building on existing projects, particularly Projet GEM. Specific future activities should include:

- Continuing the expansion of Projet GEM to include pollution prevention and energy conservation. This trains GEM engineers in pollution prevention so they can perform plant environmental audits and identify attractive opportunities to save plants money while reducing pollution. This effort is assisted through the PRIDE buy-in and the World Environment Center, which provide U.S. experts for training. Additional efforts for Projet GEM include:
 - assisting the Le Centre de l'Entreprise du Maroc by providing engineering review of business plans for energy conservation and pollution prevention opportunities.
 - assisting local trade associations to develop environmental and, especially, pollution prevention programs
 - assisting the GOM to develop pollution prevention policies
 - collaborating with the USAID-sponsored Environmental Pollution Prevention Project (EP3) in Tunisia and Egypt, for example, by having technical experts on a mission to one country also visit the other to conduct a seminar or brief plant visit to train local engineers
 - working with municipal organizations and trade associations to develop pollution prevention demonstration projects. The government of Fes has shown strong interest in a demonstration project for tanneries and olive oil plants.
- Assisting privatization efforts through workshops conducted with the Ministry of Privatization to show the impacts of environmental factors on privatization. This will include plant audits to show pollution prevention opportunities, financial

analyses to show the impacts on cash flows and expected sales price, and presentations by potential buyers discussing their environmental concerns.

- Developing a major program to privatize urban environmental services, especially solid waste collection and disposal and wastewater treatment. In Morocco these services have generally been supplied by municipal entities hampered by a lack of funds and expertise. Providing these services through private organizations offers three important advantages. First, private firms can often provide the services at lower costs because they have an incentive to use more cost effective technologies and practices. Second, private organizations can be held to a service standard that few government organizations can. Finally, private organizations can often tap sources of funds the government cannot. However, implementing such a program will take a substantial amount of time because national and local governments must be convinced of the benefits and then pass laws and regulations to allow these approaches to be undertaken.

A model for this effort is the USAID Private Participation in Urban Services Project in Indonesia. This project will provide technical, legal, and business experts; demonstration programs in selected cities; awareness and information programs; and NGO involvement. It will not directly provide funding, although it will assist potential participants identify and obtain funding from other sources.

A lower-cost, shorter-term approach to this problem could be to develop a solid waste management/privatization demonstration in Safi. This approach will address a serious local problem—solid waste management—and demonstrate how the private sector can provide urban services such as solid waste collection and disposal more efficiently and less expensively than the government can. This approach is of interest to the World Bank and the Undersecretariat, which are looking at it as part of the Environmental Management Project. A more detailed description of this effort is in Annex E.

C2. Natural Resources Management

Natural resources management is a major focus of the World Bank Environmental Management Project. However, USAID can contribute to several project areas by extending existing programs and filling niches the World Bank's project does not have resources for. These are discussed in the following sections.

C2a. Extend the Tadla Resource Management Project

Serious health threats exist in the Tadla irrigation perimeter because of inappropriate agricultural practices—bilharzia in standing water, and nitrate poisoning from excessive fertilizer application. When added to groundwater contamination caused by a lack of adequate disposal of human and solid waste, the incidence of waterborne disease is very high. Drawing on its successful experience with health programs, the mission is in a

strategic position to consider developing a regional environmental health program within the context of the TRM project. The High Watershed Project, which was proposed prior to the TRM project, should also be explored. Discussions with Moroccan officials indicate a continuing interest in such a program.

In line with the TRM project's focus on the efficient use of water, another proposal is to launch a policy dialogue with the GOM on the impacts of pricing policies of feedgrains on the use and abuse of land and water resources. Such a study might be included in a larger analysis of the harmful impacts of nonwater resources policies on the degradation of water resources.

C2b. Develop Demand-Side Management in the Water Sector.

The World Bank estimates that more than \$5.2 billion are needed to fund Morocco's water and wastewater needs, which no one feels Morocco can afford under any foreseeable scenario. These estimates, however, are based only on building new supply, and not on managing demand to reduce the need for new supply. Demand-side management in the water sector offers major potential to reduce the need for new facilities by reducing the need for new water and reducing the pollution in existing water. Recent experience in the United States on managing the demand side for water has shown that it can provide water services at savings of up to two-thirds of the cost to develop new resources. This approach is similar to traditional water conservation programs, but integrates them across all sectors in all regions much more comprehensively than has been usual. Demand-side management in the water sector can be accomplished through a combination of "hardware" (new water conservation technologies, new civil works) and "software" (pricing reform, public education, institutional development, and improved maintenance and operation). Specific activities will include training, providing technical assistance, promoting awareness, developing NGOs, and conducting pilot projects.

This effort will be expensive and long-term. A short-term proof-of-concept approach can be implemented by adding a component to the current RHUDO effort evaluating water and wastewater funding. A more detailed description is included in Annex E.

Table V-2
Proposed Environmental Action Plan

Action	Type of Assistance	Related Mission Project	Related Central Project	PRISM Outcome	Purpose
Clean Technology/Pollution Prevention					
Help the GOM develop an integrated industrial environmental policy - Review SOWs for sector studies - Update Environmental Legal Strategy - Develop draft Environmental Reference Laws - Implement pilot projects - Conduct Comparative Risk Assessment	TA TA TA TA, Training TA	GEM GEM GEM GEM GEM	PRIDE PRIDE PRIDE PRIDE, EP3 PRIDE	1.1 Improved productivity and technology utilization on the part of Moroccan enterprises	Assist the Undersecretariat of State for the Environment and World Bank to develop a cost effective industrial environmental regulatory system
Help Private Sector implement CTPP - Continue Projet GEM activities - Assist privatization efforts - Privatize urban environmental services - Assist environmental NGOs	TA, Training TA TA, Training TA, Training	GEM PSA	PRIDE, EP3 PRIDE PRIDE PRIDE	1.1 Improved productivity and technology utilization on the part of Moroccan enterprises	Assist the private sector to identify and implement cost effective environmental technologies and practices
Natural Resource Conservation					
Extend Tadla Resources Management Project	TA, Training	TRM, Population/ Health	EHP	Environmental cross-cutting issue	Extend TRM project to include the entire watershed, health, and food grain pricing

Develop Water Demand Side Management	TA, Training	RHUDO		3.2 Improved provision of infrastructure and services	Incorporate water demand management into RHUDO water projects
Develop Cooperative Urban Gardening	TA, Training	RHUDO			Incorporate cash crop cooperatives into RHUDO housing upgrades
Develop Coastal Zone Management	TA, Training		CRMP, NOAA		Support Ministry of Public Works coastal zone management program
Evaluate Biodiversity	TA		WRI		Determine need for biodiversity efforts
Environmental Awareness/Information/Education					
Perform Needs Assessment	TA		GreenCom, PRIDE		Determine environmental education needs of mission projects
Include Environmental Training in TFD	Training	TFD	USETI		Expand TFD Project to support environmental training and expand courses taught in French
Provide Environmental Assessment Training	Training	RHUDO	PRIDE		Provide Environmental Assessment training for ANHI personnel on RHUDO projects

C2c. Develop a Cooperative Gardening Component for RHUDO

This feasibility study will evaluate cooperative gardens as an environmental and economic development component of the RHUDO housing upgrade program. The idea is to create cooperatives of property owners to grow cash crops on land put aside for this purpose as part of the land use planning for new resettlement areas. Vegetables grown might be reserved for the families growing them or might be sold as an economic incentive to stop speculative development and foster stable settlement. The notion of urban agriculture fits into a new program supported by the GOM of planting greenbelts around all urban centers and including green spaces within them. Oujda, Rabat, and Casablanca have already received attention.

C2d. Develop a Coastal Zone Management Program

Coastal zone management is a major priority for Morocco that has received relatively few resources. The Ministry of Public Works is considering a large coastal zone management program to which the United States can contribute expertise in desalinization technology (to mitigate the strong possibility of water shortages by the end of this century), a remote sensing evaluation of beach morphology along the Atlantic littoral, and development of an oceanographic center.

C2e. Evaluate Biodiversity Options

There is not enough information at present to evaluate the need for a biodiversity initiative. Morocco's diversity of climate and geography give it a wide diversity of flora and fauna, and there are indications that some species are becoming extinct because of human activities. A biodiversity activity may be appropriate for an organization such as the World Resources Institute (WRI) to perform with assistance from the Undersecretariat. Alternatively, WRI could, rather than conduct the assessment, assist the Undersecretariat to develop its capabilities through training and workshops in Morocco and the United States.

C3. Environmental Awareness/Information/Education

These projects address perhaps the most serious environmental problem in Morocco, the lack of environmental awareness by the general populace. Many of these projects draw upon American experience and current U.S. government policy initiatives and are natural activities for mission consideration.

C3a. Perform Environmental Education/Information Needs Assessment

A short task should be undertaken with assistance from the Global Bureau to determine specific needs and/or the need for a more extensive assessment. Specific focuses for this assessment will include:

- Evaluate the need for training in communications techniques (particularly in "distance education") for the Direction de Sensibilisation of the Undersecretariat. This division is responsible for national environmental awareness activities and has expressed interest in this assistance.
- Evaluate options for including environmental considerations into grades K-12, possible under the aegis of the new Global Learning and Observation to Benefit the Environment (GLOBE) initiative proposed by Vice President Gore.
- Evaluate providing an environmental database, including computer hardware and software, that is accessible to the private sector, public sector, and NGOs. The database would provide information on the environmental situation in Morocco and other countries, technical information, environmental technologies and services, contacts and references, legislation, upcoming environmental events, and access to Internet environmental resources. The mission, through the GEM, PRIDE, and EP3 projects and through the U.S. Environmental Protection Agency, is uniquely positioned to provide a large base of information especially in clean technology and pollution prevention.

C3b. Include Environmental Training in the Training for Development Project

The TFD project could provide training in environmental management if the environment were targeted as a training focus, and could supplement training provided by other mission projects such as Projet GEM. For Morocco, however, it will be important to expand courses taught in French because fluent English language capabilities necessary for advanced courses are not widespread in the target business, government, and NGO audiences. USAID, under the TFD project, currently provides funding for five Undersecretariat of State for the Environment staff to study English at the American Learning Center in Rabat.

C3c. Provide Environmental Assessment Training

As part of the Housing Guarantee Loan program, RHUDO is requiring environmental assessments for all new ANHI projects. Under its grant program, RHUDO will provide technical assistance and training in environmental assessments for ANHI and municipal staff.

SECTION VI

IMPLEMENTATION STRATEGY

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SECTION VI IMPLEMENTATION STRATEGY

This section focuses on priority activities that the mission can undertake in the near term primarily using existing funding sources and programs. That discussion is followed by a discussion of higher-cost, longer-term activities that could be undertaken if additional funds become available.

A. Near-Term Activities

From the attractive environmental activities discussed in the previous section, a subset was selected for the mission to focus on in the near-term. These were selected on the basis of the:

- Existing portfolio of the mission
- Availability of funding and personnel
- Complementarity with environmental activities currently funded by other international donors
- GOM's view of as yet unfunded but urgent needs

A1. Clean Technology/Pollution Prevention

The major focus here is two-fold: GOM policies and implementation, and support for private sector activities. These are only listed here because they were discussed in detail in the previous section. The GOM support activities include:

- Update Environmental Legal Strategy.
- Develop draft National Reference Laws.
- Develop projects for one to three cities.
- Conduct a Comparative Risk Assessment for Casablanca/Mohammedia corridor.

Private sector support activities include:

- Support Projet GEM pollution prevention technical assistance.
- Assist privatization activities.
- Support NGO activities.

These projects are particularly important because the GOM is developing the institutional and regulatory basis for its environmental controls that will determine the compliance costs over the next decade or more. USAID can provide the U.S. experience on these that will allow them to balance CAC and MB incentives to give them the most effective system.

Table VI-1

Recommended Near-Term Activities
<p>Support Clean Technology/Pollution Prevention Activities</p> <ul style="list-style-type: none"> • Help the Government of Morocco develop an integrated environmental protection strategy <ul style="list-style-type: none"> - Update Environmental Legal Strategy - Develop draft National Reference Laws - Develop projects for one to three cities - Conduct Comparative Risk Assessment for Casablanca/Mohammedia corridor • Help the private sector develop an integrated environmental protection strategy <ul style="list-style-type: none"> - Support Projet GEM pollution prevention technical assistance - Assist privatization activities - Support NGO activities
<p>Support Environmental Training/Information/Awareness</p> <ul style="list-style-type: none"> • Support environmental training in French through the TFD project • Support Environmental Assessment training for ANHI and municipal staff • Assess environmental awareness needs
<p>Support Natural Resources Conservation Activities</p> <ul style="list-style-type: none"> • Evaluate biodiversity problems • Evaluate urban agriculture prospects in RHUDO activities

A2. Support Environmental Training/Information/Awareness.

These near-term activities include:

- Support environmental training in French through the TFD project.
- Support environmental assessment training for ANHI and municipal staff.
- Assess environmental awareness needs.

A3. Support Natural Resources Management Activities.

These near-term activities include:

- Evaluate biodiversity problems.
- Evaluate urban agriculture prospects in RHUDO activities.

B. Long-Term Activities

Several longer-term, higher-cost activities were identified as part of this effort. These will depend on significant additional funding sources being identified. These include

- Private participation in urban environmental services
- Extending the Tadla Resources Management Project
- Developing water demand-side management
- Developing coastal zone management

Table VI-2

Recommended Long-Term Activities	
Support Clean Technology/Pollution Prevention Activities	
•	Develop Private Urban Environmental Services Project
Support Environmental Training/Information/Awareness	
Support Natural Resources Conservation Activities	
•	Extend Tadla Resources Management Project
•	Develop water demand side management
•	Assist coastal zone management

C. Opportunities and Constraints

This subsection deals briefly with funding and manpower issues.

C1. Funding

Some unearmarked monies are available that could be used to support some proposed near-term activities. Monies consist of \$300,000 in unexpended PRIDE buy-in funds and \$250,000 from DSTS targeted for environmental expenditure. In addition, the World Resources Institute, a "green" NGO that has a cooperative agreement with USAID, has \$68,000 specifically targeted for Morocco and would be an appropriate instrument to carry out proposed activities, such as evaluating biodiversity, assisting with awareness, and possibly assisting with coastal zone management activities.

RHUDO and the TRM project each have approximately \$200,000 that might be made available for environmental activities supporting their primary mandates. This will be better known after the upcoming program review. In all, however, there appears to be approximately \$1 million within the mission budget to pursue an expanded environmental agenda.

C2. Manpower

Manpower will be as severe a problem for the mission's environmental program as funding. Because the mission is perceived to be in a disengagement phase, it is likely that staff will be cut considerably in the near future. A number of people involved with the projects discussed in this strategy are scheduled to leave within the next year at the conclusion of their normal assignments and they may not be replaced.

Although the PRIDE team cannot speculate on exactly how this will affect the mission's environmental program, the mission must be careful not to overextend its management resources. One option to relieve these problems is to use buy-ins to centrally funded projects.

ANNEX A

PERSONS CONTACTED

ANNEX A
PERSONS CONTACTED

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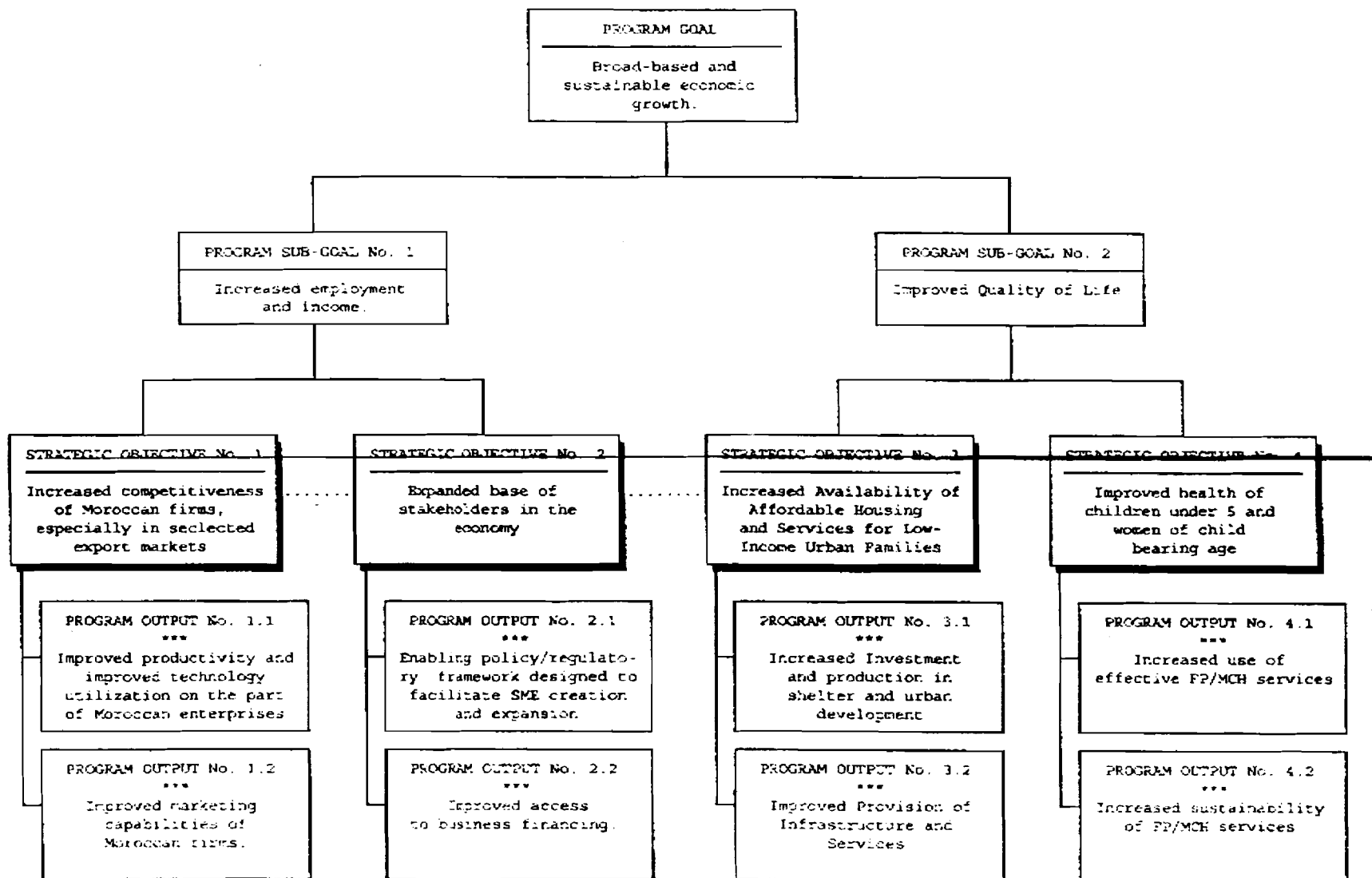
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ANNEX C

USAID/MOROCCO PRISM OBJECTIVE TREE

USAID/Morocco Program Objective Tree



C-1

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ANNEX D

DESCRIPTION OF CENTRALLY FUNDED PROJECTS

Description of Centrally Funded Projects

PROJECT	PROJECT DESCRIPTION	CONTRACTORS	PROJECT OFFICE
<p>Biomass Energy Systems and Technology (BEST)</p> <p>Project Number: 936-5737</p> <p>PACD: 1996</p>	<p>BEST uses proven technologies and systems adapted to developing country conditions to identify and reduce the technical, economic, financial, and institutional risks of investment in biomass-fueled power production in AID assisted countries.</p> <p>Activities:</p> <ul style="list-style-type: none"> • Industry resource assessments • Technical assistance and exchanges • Information dissemination 	<p>Winrock International</p>	<p>G/ENV/EET</p> <p>Ross Pumfrey (703) 875-4694</p> <p>Director: John Kadyszewski (Winrock) (703) 525-9430</p>
<p>Coastal Resources Management Project (CRMP)</p> <p>Project Number: 936-5518</p> <p>PACD: 1995</p>	<p>The CRM project aims to strengthen the capacity of public/private institutions to manage coastal resources more efficiently, with emphasis on regional planning.</p> <p>Activities:</p> <ul style="list-style-type: none"> • Technical assistance • Education and training 	<p>University of Rhode Island</p>	<p>G/ENV/ENR</p> <p>John Wilson (703) 875-4539</p> <p>Director: Stephen Olsen (URI) (401) 792-6224</p>
<p>Conservation of Biological Diversity (CBD)</p> <p>Project Number: 936-5554</p> <p>PACD: 1998</p>	<p>The CBD project goal is to improve the capacities of developing countries to identify the need and economic potential of conserving/managing biological resources.</p> <p>Activities:</p> <ul style="list-style-type: none"> • Technical assistance • Biodiversity research • Training • Information and evaluation network of conservation activities <p>CBD is implemented through the Biodiversity Support Program (BSP)</p>	<p>BSP Consortium</p> <ul style="list-style-type: none"> • World Wildlife Fund • The Nature Conservancy • World Resources Institute 	<p>G/ENV/ENR</p> <p>Mike Philley (703) 875-4058</p> <p>Director: Kathy Saterson (BSP) (202) 861-8330</p>

<p>Development Strategies for Fragile Lands (DESFIL)</p> <p>Project Number: 936-5438</p> <p>PACD: 1995</p>	<p>DESFIL seeks to improve national, regional, and local strategies for development in areas where natural resources are subject to rapid degradation.</p> <p>Activities:</p> <ul style="list-style-type: none"> • Technical assistance • Training workshops 	<p>Chemonics International; Rodale Institute; Abt Associates; Datex Inc.</p>	<p>G/EG/EIR</p> <p>Larry Abel (703) 875-4445</p> <p>Director: Bruce Ross-Sheriff (Chemonics) (202) 331-1860</p>
<p>Energy Efficiency Project (EEP)</p> <p>Project Number: 936-5743</p> <p>PACD: 1997</p>	<p>EEP works to implement activities and help develop long-term policies and projects in USAID-assisted countries that will reduce energy consumption and CO₂ emissions and contribute to a reduction of global warming.</p> <p>Activities:</p> <ul style="list-style-type: none"> • Technical assistance • Policy development and institutional support • Information dissemination and training workshops 	<p>RCG/Hagler, Bailly, Inc.</p>	<p>G/ENV/EET</p> <p>David Jhirad (703) 875-4029</p> <p>Director: John Armstrong (HBI) (703) 351-0300</p>
<p>Energy Technology Innovation Project (ETIP)</p> <p>Project Number: 936-5741</p> <p>PACD: 2001</p>	<p>This project was designed along with the Energy Project Development Fund (EPDF) to be independently managed projects promoting energy sector technology innovation in USAID-assisted countries.</p> <p>Activities:</p> <ul style="list-style-type: none"> • Engineering services • Technology transfer and technical assistance • Assessments of indigenous energy sources 	<p>Bechtel Corporation</p>	<p>G/ENV/EET</p> <p>Samuel Schweitzer (703) 875-4072</p> <p>Director: Frederick V. Karlson (Bechtel) (703) 528-4488</p>

<p>Energy Training Project (ETP)</p> <p>Project Number: 936-5734</p> <p>PACD: 1997</p>	<p>ETP provides training for energy and environmental professionals from developing countries in how best to identify, utilize, and manage their energy needs.</p> <p>Activities:</p> <ul style="list-style-type: none"> • Training courses and needs assessments • Study tours and internships 	<p>Institute of International Education (IIE) United States Energy Association (USEA)</p>	<p>G/ENV/EET</p> <p>Carol Pierstorf (703) 235-4960</p> <p>Directors: Ahmad Ghamarian (IIE) (202) 682-6560</p> <p>Will Polen (USEA) (202) 331-0415</p>
<p>Environmental and Natural Resources Policy and Training (EPAT)</p> <p>Project Number: 936-5555</p> <p>PACD: 2001</p>	<p>EPAT aims to assist policy makers in LDCs to recognize the strong relationship between economic policies and environmentally sustainable development. Special areas of implementation are policy analysis, institution strengthening, workshops/seminars.</p> <p>Activities:</p> <ul style="list-style-type: none"> • Technical assistance (Winrock International) • Economic policy research (MUCIA) 	<p>Winrock International MUCIA</p>	<p>G/ENV/ENR</p> <p>Russ Mischeloff (703) 875-4046</p> <p>Directors: Douglas Clark (Winrock) (703) 525-9430</p> <p>Nick Poulton (MUCIA) (703) 841-0026</p>

<p>Environmental Planning and Management (EPM)</p> <p>Project Number: 936-5517</p> <p>PACD: 08/95</p> <p>Now developing new project: Environmental Planning and Institutional Capacity (EPIC)</p>	<p>The EPM goal is to strengthen environmental planning through better management and conservation of natural resources in LDCs. EPM has identified its components as: Developing NRM strategies and assessments, NGO support, NRM data management, and sustainable agriculture.</p> <p>Activities:</p> <ul style="list-style-type: none"> • Technical assistance • Resource policy research 	<p>World Resources Institute (WRI)</p>	<p>G/ENV/ENR</p> <p>John Wilson (703) 875-4539</p> <p>Cooperator: Walter Arensberg (WRI) (202) 638-6300</p>
<p>Environmental Pollution Prevention Program (EP3)</p> <p>Project Number: 936-5559</p> <p>PACD: 1999</p>	<p>EP3 provides technical field support in industrial pollution, prevention and control. Main components are:</p> <ul style="list-style-type: none"> • Pollution prevention audits • National cleaner technologies programs • Investment promotion • Pollution prevention training <p>Activities:</p> <ul style="list-style-type: none"> • Technical assistance • Training 	<p>RCG/Hagler, Bailly, Inc. Water Environment Federation EPA</p>	<p>G/ENV/ENR</p> <p>Jim Gallup (703) 875-4518</p>

<p>Forest Resource Management II (FRM II)</p> <p>Project Number: 936-5556</p> <p>PACD: 2000</p>	<p>FRM II was designed to strengthen the capacity of forestry and natural resources institutions in LDCs through private/public sector initiatives. Main components are:</p> <ul style="list-style-type: none"> • Forestry Support Program (FSP) • Private sector development through Southwestern Center for Forest Economics Research (SCFER) and AID/PRE <p>Activities:</p> <ul style="list-style-type: none"> • Technical assistance • Training (ST) 	<p>USDA/FS SCFER USDA/OICD Peace Corps</p>	<p>G/ENV/ENR</p> <p>Mike Benge (703) 875-4063</p> <p>Cooperators: Gary Wetterberg (USDA/FS)</p> <p>Bruce Crossan (USDA/OICD)</p> <p>George Mahaffy (Peace Corps)</p>
<p>Forestry/Fuelwood Research and Development (F/FRED)</p> <p>Project Number: 936-5547</p> <p>PACD: 06/94</p>	<p>The goal of this project is to enhance forestry/fuelwood and agroforestry in LDCs. The project has two components:</p> <p>Winrock component consisting of network development, regional research support, global research and database development, training, publications and information</p> <p>ICRAF component seeks to generate appropriate technologies and to strengthen the capacity of national institutions for agroforestry research.</p>	<p>Winrock International International Centre for Research in Agroforestry (ICRAF)</p>	<p>G/ENV/ENR</p> <p>Mike Benge (703) 875-4063</p> <p>Cooperator: Thomas Niblock (703) 525-9430</p>
<p>Environmental Education and Communication Project (GREENCOM)</p> <p>Project Number: 936-5839</p> <p>PACD: 2000</p>	<p>GREENCOM is designed to provide communications and education support for AID environmental objectives by promoting public awareness and support for new environmental policies and practices.</p> <p>Activities:</p> <ul style="list-style-type: none"> • Research and development • Technical assistance • Training 	<p>AED Chemonics International NAAEE GLOVIS</p>	<p>G/HED and G/ENV/ENR</p> <p>Tony Meyer (703) 875-4782</p>

<p>Environmental Health Project (EHP)</p> <p>Project Number: 936-5973</p> <p>PACD: 1993</p>	<p>The project offers assistance to address environmental health conditions in developing countries. Subsectors of EHP include tropical diseases, water supply and sanitation, solid waste, wastewater, air-pollution, food hygiene, hazardous materials, occupational health and injury.</p> <p>Activities:</p> <ul style="list-style-type: none"> • Technical assistance • Priority setting of funds to maintain balance between development and environment 	<p>Camp Dresser & McKee International, Inc.; International Science and Technology Institute, Inc.; Research Triangle Institute; Training Resources Group; Radian, Inc.; John Snow, Inc.</p>	<p>G/PHN/HN/CD</p> <p>Dennis Carrol (703) 875-4480</p>
<p>Irrigation Support Project for Asia and the Near East (ISPAN)</p> <p>Project Number: 398-0298</p> <p>PACD: 09/94</p>	<p>The purpose of this project is to provide assistance in water resources management and to examine broad regional policy and strategic issues and trends in water resources management.</p>	<p>Camp Dresser & McKee International, Inc.; Care; Cornell University; Development Alternatives Inc.; Harza Engineering Co.; International Science and Technology Institute, Inc.; Training Resources Group; University of Arizona</p>	<p>ANE/NE/DR/PI</p> <p>Herb Blank (202) 663-2460</p>

<p>Private Sector Energy Development (PSED)</p> <p>Project Number: 936-5738</p> <p>PACD: 1996</p>	<p>PSED works to remove policy and institutional barriers to private-sector energy development; provide direct assistance in energy project development; and foster the development of privately-owned power plants and energy projects</p> <p>Activities:</p> <ul style="list-style-type: none"> • Technical assistance • Workshops and seminars • Information dissemination 	<p>K&M Engineering and Consulting Group; Price Waterhouse</p>	<p>G/ENV/EET</p> <p>Samuel Schweitzer (703) 875-4072</p> <p>Directors: Jeffrey Humber (K&M) (703) 524-4400</p> <p>Kami Rabani (Price Waterhouse) (202) 861-6298</p>
<p>Project in Development and the Environment (PRIDE)</p> <p>Project Number: 398-0365</p> <p>PACD: 1995</p>	<p>This project offers technical, analytical, and informational support for the AID objectives of fostering ENR management consistent with sustainable economic growth.</p> <p>Activities:</p> <ul style="list-style-type: none"> • Technical assistance • Workshops and training • Information dissemination 	<p>Prime: Chemonics International</p> <p>Subcontractors: Science Applications International Corp.; Resource Management International; Capital Systems Group, Inc.; RCG/Hagler, Bailly, Incorporated; Environomics, Inc.; Industrial Economics</p>	<p>ANE/NE/DR</p> <p>Dwight Walker (202) 663-2493</p> <p>Director: Avrom Bendavid-Val (Chemonics) (202) 331-1860</p>

<p>Renewable Energy Applications/Training Project (REAT)</p> <p>Project Number: 936-5730</p> <p>PACD: 1995</p>	<p>REAT promotes and assists the application of economically and environmentally sustainable renewable energy technologies in developing countries.</p> <p>Activities:</p> <ul style="list-style-type: none"> • Project identification, design, preparation and development • Education and training • Economic and technical evaluation 	<p>US Export Council for Renewable Energy (US/ECRE)</p>	<p>G/ENV/EET</p> <p>Ross Pumfrey (703) 875-4694</p> <p>Director: Scott Sklar (US/ECRE) (202) 408-0665</p>
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ANNEX E

DESCRIPTIONS OF TWO RECOMMENDED LONG-TERM ACTIVITIES

NEW ACTIVITY PROPOSAL WATER DEMAND-SIDE MANAGEMENT

Problem statement. Water supply in Morocco, as in most Near East countries, is a constraint on economic development and public health. Urban and industrial water use is growing at about 8 percent annually. Several regions will exhibit significant deficits by 2000, and by 2020 water deficit will be a problem in all regions. But even now river waters are heavily polluted, so heavily that in some areas industry is pumping groundwater. Only 35 percent of the population (65 percent of the urban population) is connected to sewer systems, and there are no wastewater treatment plants operating in the country. Most major rivers flowing through urban and industrial concentrations have almost no living organisms in them. Pesticide and fertilizer residues have caused eutrophication in the rivers, adversely affected human populations, and reduced the agricultural productivity of the soil. These problems are exacerbated by institutional problems, such as pricing water below its replacement cost, and poor management that results in wasting as much as one-third of the water used in irrigation.

To tackle these problems, the Government of Morocco is looking primarily to traditional water and wastewater projects funded through the World Bank and similar organizations. However, the World Bank estimates that more than \$5.2 billion is needed to fund these projects, which Morocco cannot afford under any practical scenario. These plans focus primarily, however, on building new supply, and not on managing demand to reduce the need for new supply. Demand-side management in the water sector offers major potential to reduce the need for new facilities by reducing demand for new water and pollution of existing water. Recent experience in the U.S. on managing the "demand side" for water has shown that this approach can provide water at savings of up to two-thirds the cost of developing new resources. It is very similar to traditional water conservation programs, but integrates them across all sectors in all regions in a much more comprehensive manner. The approach can be carried out through a combination of "hardware" (new water conservation technologies, new civil works) and "software" (pricing reform, public education, institutional development, maintenance and operation performance).

Description. This project will help the public and private sectors in Morocco institute comprehensive water demand-side management capabilities through both "software" and "hardware" improvements. Specific objectives include:

- **Institutional reform:** Focusing on development of effective local water user associations to manage supply and conservation activities.
- **Pricing reform:** Stimulating conservation by pricing water to reflect its true value/replacement cost, and having polluters pay clean-up costs.

- **Private sector development:** Having the Moroccan private sector provide goods and services (including normally public services such as wastewater treatment) to improve the efficiency of water use.
- **NGO support:** Enlisting NGOs to develop public awareness of the potential seriousness of water problems and cooperation in addressing them and reducing demand.

The project will build on recent U.S. experience in using demand-side management techniques to reduce the need for new investment in civil works and the serious economic, health, and social consequences of inadequate water supplies.

Specific activities will include:

- Training Moroccan public and private sector personnel in the design and implementation of effective water demand-side management programs, both in Morocco and the United States. This will include workshops and seminars on specific topics, including government policies, economic valuations, private sector opportunities, and NGO programs.
- Assistance in economic evaluation of water pricing, particularly evaluation of current and future adverse impacts of the current practice of underpricing, and policy studies of ways to mitigate the impact of properly priced water on major affected groups such as farmers, industry, and municipalities.
- Technical assistance to affected groups to facilitate policy reform and identify and implement water conservation opportunities. For example, Project GEM could help identify water conservation opportunities in industry as part of its pollution prevention activities. The Tadla project could be expanded to evaluate and implement activities in agriculture in the Tadla region. This component will include extensive cooperation with existing USAID/Morocco projects providing assistance in related areas.
- Pilot projects showing the actual impacts of various technologies and institutional reforms. These will be relatively low-cost activities (typically having equipment costs under \$50,000). Technology projects may include industrial water recycling, low flush toilets, water flow restrictors, improved metering, advanced leak detection, drip irrigation, and wastewater reuse in industry and agriculture. Institutional development projects may include private sector provision of wastewater treatment and recycling services, water user groups, and water rights reforms. At least 20 sub-projects will be carried out.
- Development of NGOs to plan and implement effective water conservation activities in both rural and urban areas.

Duration: Five to six years.

Budget: \$5-10 million.

NEW ACTIVITY PROPOSAL

PRIVATIZATION OF URBAN ENVIRONMENTAL SERVICES

Problem statement. Important urban environmental services are seriously lacking in Morocco, especially in the solid waste and wastewater areas. For example, there are no operating wastewater treatment plants in the country; the major cities dump the sewage into rivers, the Atlantic Ocean, and the Mediterranean Sea. This in turn has caused major pollution problems that affect public health severely and have reduced tourism. These services have been promoted primarily through local public entities, which have been hampered by a lack of capital, expertise, and real incentive to provide a high standard of service. Providing these services through private organizations offers three important advantages. First, private firms can often provide the services at lower cost because they have an incentive to use fewer people and more cost-effective technologies and practices. Second, they can be held to a higher quality standard than most government organizations. Finally, they can provide sources of funds that the government cannot.

However, developing a comprehensive and national private service initiative requires addressing many major issues:

- Setting up the proper legal and regulatory framework and resolving inter-jurisdictional issues.
- Handling the procurement process for services (developing Terms of Reference, bidding, selection of winner, negotiations).
- Setting and enforcing standards for service.
- Setting fair and reasonable tariffs, especially in monopoly situations.
- Determining a financial and business structure to use (such as a public/private joint partnership, Build-Own-Transfer, Build-Own-Operate, etc.).
- Determining necessary government guarantees.
- Assessing whether local governments have the capacity to manage the process and continuing operations.
- Structuring and financing demonstration projects that address key administrative, finance, operational, and technical issues.

Description. The objective of this project is to help Morocco develop a vibrant private sector to provide major urban environmental services in wastewater and solid waste. It will do this by assisting national and local Moroccan government organizations, Moroccan

private sector firms, U.S. private sector firms, and Moroccan NGOs in planning and delivering these services. Specific activities will include:

- **Training Moroccan national and local government personnel.** They will be trained in the design and implementation of private sector environmental projects, with a focus on laws and regulations, setting and enforcing service standards, tariff design, procuring services, financing, government guarantees, and economic analysis.
- **Design and implementation of at least 12 actual projects.** A reasonable portfolio might include six solid waste and six wastewater projects, with one of each in a major Moroccan city (e.g., Rabat, Casablanca/Mohammedia), one or two of each in a medium-size city (e.g., Fes, Marrakesh), and three or four of each type in a smaller city (e.g., Beni Mellal). This will include providing U.S. technical, legal, regulatory, and business experts to help Moroccan counterparts develop appropriate laws, issue requests for proposals, evaluate bids, negotiate terms, set tariffs, enforce standards, and other critical activities. A broad approach will be used that will include incorporating waste minimization programs (recycling, proper maintenance and repair, conservation, public awareness, etc.) as cost-effective adjuncts to the environmental service programs. These programs will serve as demonstrations to other Moroccan towns and cities to illustrate the advantages (and problems) of the private sector approach. The results will be presented in national and international forums to stimulate additional replications. This component will not finance projects directly, but will help identify and negotiate financing and provide technical assistance to all parties.
- **Involvement of NGOs in project design and implementation.** NGOs have major roles in stimulating public awareness of environmental problems and gaining public cooperation in conservation and clean-up activities. This component will help NGOs identify and develop opportunities (such as recycling), work with NGOs in the United States and other countries to transfer know-how, and develop necessary management and marketing skills.

Duration: Four to six years.

Budget: \$10-15 million.